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Anterior cruciate ligament reconstruction as a day case with extended recovery

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Abstract

The aim of this study was to describe the procedures and the postoperative outcome of arthroscopic anterior cruciate ligament (ACL) reconstruction when carried out a day case with extended recovery. Between December 1995 and September 1998, 91 patients underwent surgery using bone-patellatendon-bone autografts and interference screw fixation. Additional surgical procedures were performed on 35 of the patients. The patient records were evaluated for a mean of 17 months (1–33 months) postoperatively. The course of treatment was. (1) Evaluation and KLT-arthrometer test 14 days preoperatively. (2) Surgery, cryocuff, bupivacain, paracetamol, NSAID and ketobemidon for postoperative pain control. (3) Discharge from hospital within 24 h. (4) Physiotherapy after 14 days. (5) Follow-up after 6 weeks with bandage removal and after 6 months. Eight patients required one further day of hospitalisation due to pain (four), nausea (one), haematoma (two) and prolonged anaesthesia (one). Five patients were readmitted to hospital for a mean of 8 (3–16) days postoperatively. Three patients underwent re-surgery due to haematoma/rupture of the scar. No deep infections were found. We concluded that this effective method of ACL-reconstruction can be carried out safely as a day case procedure with extended recovery to the benefit of the patients.

Keywords: Anterior cruciate ligament; Reconstruction; Day care

Cost containment issues have had a major impact on almost all hospital departments world-wide. Many surgical procedures previously performed in an inpatient setting are now being performed on an outpatient basis bringing down costs and benefiting patients who can enjoy earlier the comfort of a home environment. This development in surgical procedures is mainly due to advanced technology and more efficient pain control postoperatively.

In addition it seems as if the attitude towards day-surgery procedures has changed in recent years.

1. Materials and methods

Between December 1995 and September 1998, 91 patients underwent reconstruction of the anterior cruciate ligament (ACL) as an outpatient procedure in our department. The operations were undertaken by six surgeons of differing experience.

We have focused on the pre-/postoperative procedures and the follow up of the patients. There were 37 female and 34 male patients with a mean age of 26 years. (range 16–40 years). The patients records were evaluated, for a mean of 17 (1–33) months postoperatively. Starting 2 months before operation all patients went through a training course supported by physiotherpaists in order to stimulate the vastus musculature.

The patients underwent arthroscopically assisted ACL reconstruction. In 57 patients only ACL reconstruction was performed, 31 patients also had a meniscectomy and in three patients the meniscus was also reconstructed with meniscal arrows.

The operations were either under general anaesthesia (44 patients) or under spinal anaesthesia (47 patients). When harvesting the graft a tourniquet was used. Preoperatively meticillin or cefuoxim 2/1.5 g intravenously were given depending on allergies to penicillin. All

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patients had marcain 0.25% with adrenalin injected intraarticularily and into the wound after the procedure and a cold compressive bandage was applied (Cryocuff) in the operating suite together with a knee immobilizer allowing 0–90° flexion. All patients were allowed normal weightbearing. The knee immobilizer was used for a period of 6 weeks. The patients had prolonged recovery and were discharged the next morning. This procedure seems to give the patients a good understanding of the procedure and the postoperative situation. As postoperative paincontrol paracetamol, NSAID and ketobemidon, were used. The patients had the stitches removed after 14 days. All patients were seen in the ambulatory unit again after 6 weeks and 6 months. The physiotherapist was involved actively after the stitches were removed. The overall procedure is summarised in Table 1.

2. Results

Eight patients required one further day of hospitalisation postoperatively due to pain (four), nausea (one), haematoma (two) and prolonged anaesthesia (one). Complications did occur in three patients who required surgical intervention for haematoma wound rupture. Three patients were readmitted a few days postoperatively for observation of possible infection. All three patients had non-infectious reaction in the knee. Cultures were negative. Two patients were reoperated due to unacceptable Lachmann looseness combined with a subjective feeling of continual instability.

Three patients had the interferrens-screw in the tibia removed due to pain and this had good results. No deep or intrarticular infections were found.

Table 1
Summary of outpatient procedure for anterior cruciate ligament reconstruction

Operative indication made either clinically or after arthroscopy performed earlier
Physiotherapy training course, 6 months
Patient meets surgeon 14 days preoperatively and knee-loosness is measured by KLT-1000 arthrometer. Conversation with anaesthetist and nurse
Arthroscopy and ACL-reconstruction including additional surgery. Bracing and cryotherpay at the end of surgery
Post-operatively observation and pain control. Overnight stay. Short conversation with physiotherapist before discharge
Stitch removal after 2 weeks. Afterwards physiotherapy
Brace removal after 6 weeks
Last control after 6 months.

3. Discussion

Postoperative planning is essential if outpatient ACL reconstruction is to be successful. All patients that had reconstruction of the ACL underwent a programme of exercise in order to strengthen the vastus musculature of the thigh. If the patient after ending this programme still had serious complaints, reconstruction of the ACL was considered. When the ACL is being reconstructed it is important that the patient is cooperative and motivated to cope with the postoperative longterm exercise and restrictions, which means that the surgeon during the preparations and discussions with the patient must get an impression of the patient as to whether he or she is able to live up to the posteraptive challenges concerning the program of exercise. Parameters that also must be taken into account are age, symptoms and whether the patient daily feels handicapped. Also important to discuss with patients are the goals of surgery and rehabiliation and how those goals are going to be met. The patient must be taught crutch training and it is vital that the patient has good support at home.

The mean age of our patients was 26 years (range 16–40 years). This age is important and one the reasons for the possibility of reconstructing ACL's on an outpatient basis. All patients requiring this operation are young and fit with low anaesthetic risks. Another necessity for successful treatment is sufficient paincontrol postoperatively. In our patients only four had to stay at hospital one extra day due to pain, which is acceptable.

Postoperative pain control can be undertaken in several ways. Ketoralac is most commonly used preoperatively either intravenously or intramuscularly in doses varying from 10 to 60 mg and bupivacain 0.25 to 0.5% 20 ml with or without adrenalin is injected into the knee postoperatively period [1–4]. At home; paracetamol and codein is observed to be sufficient [5]. In our patients paracetamol and NSAID have been sufficient pain treatment. Nausea and vomiting seems to be common cause of morbidity and have been shown to be a significant cause of unexpected hospital admission from the day case unit [6]. In our series only 2% were admitted for these reasons but almost 4.5% required one extra day of hospitalisation due to pain. Nausea and vomiting are generally caused by general anaesthesia. Femoral-sciatic nerve block is a safe and reliable alternative to general anaesthesia and can be used in the day unit [3]

The overall complication rate of 20% is not higher than other studies which report rates from 3.6 [7] to 50% [6]. If only surgical complications are taken into account the rate lowers to 9% which is no higher than other studies. One might question whether the complication rate could have been lower in our study, if a drainage tube had been used thus avoiding postoperative haematoma and rupture of the wound.

Intravenous antibiotics were used and we did not observe any deep infections.

In a study [8] comparing outpatients and inpatients ACL reconstruction, there was no significant difference between the time required to regain active range of motion. This study [8] describes the use of a continuous passive motion machine (CPM) which is used immediately postoperatively allowing initially 0–30° movement which is increased by 10° daily as tolerated until the patient achieves 120° flexion. The CPM is used at home too. These patients were allowed partial weight bearing.

All our patients were allowed total weight bearing immediately post-operativley together with flexion from 0–90°. This is not common. In some studies [8,5] full weightbearing is not allowed initially and knee-movement is gradually increased during the first 6 weeks.

4. Conclusion

When evaluating our material, we find that our procedure for reconstruction of the ACL is satisfactory, including the complication rate and postoperative pain control. We think that our patients are mobilised more easily — with knee flexion up to 90° immediately with full weight bearing — than in other studies to the benefit of our patients. ACL reconstruction can safely be carried out as a day case procedure with extended recovery.

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